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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,988	10/31/2003	Brian M. Sager	NSL-014	8858

27652 7590 05/02/2006

JOSHUA D. ISENBERG  
204 CASTRO LANE  
FREMONT, CA 94539

EXAMINER

PATTERSON, MARC A

ART UNIT PAPER NUMBER

1772

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/698,988	<b>Applicant(s)</b> SAGER ET AL.	
	<b>Examiner</b> Marc A. Patterson	<b>Art Unit</b> 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 12-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## DETAILED ACTION

### WITHDRAWN OBJECTIONS

1. The 35 U.S.C. 102(b) rejection of Claims 12 – 14, 20 – 21, 23 – 25 and 27 – 29 as being anticipated by Chiao (U.S. Patent No. 6,472,467 B1), of record on page 3 of the previous Action, is withdrawn.

### NEW REJECTIONS

#### *Claim Objections*

2. Claim 27 is objected to because of the following informalities: The phrase 'polymer material' has insufficient antecedent basis. Appropriate correction is required.

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 12 – 14, 20 – 21, 23 – 25, 27 – 30 and 34 – 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Singh et al (U.S. Patent No. 6,057,035).

With regard to Claims 12, 14, 25, 28 – 30 and 34 – 35, Singh et al discloses an inorganic / organic nanolaminate (polymer / inorganic nanocomposite material; column 1, lines 48 – 49) film (column 2, lines 1 – 3) which is a barrier film (enhanced thermal stability, therefore acting as a barrier to the effects of thermal instability; column 1, lines 41 – 45) having a plurality of layers of an inorganic material (silicate layers, therefore

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discrete layers comprising multiple layers or lamellae and consisting of silicate and having a different composition from a polymer layer; column 2, lines 26 – 29) and a plurality of layers each consisting of an organic polymer wherein the layers of organic polymer alternate with the layers of inorganic material (polymer chains between the layers; column 3, lines 45 – 50) wherein the adjacent layers of the film are covalently bonded layers characterized by covalent bonds that couple adjacent layers together (the surfactant that bonds the layers is bonded to the inorganic material, a silicate, through a Si-C bond; column 3, lines 18 – 23); the inorganic material presents a long and tortuous path to an underlying substrate (tortuous path; column 5, lines 13 – 15) and the film is a barrier film (column 5, line 8).

With regard to Claim 13, as stated above, Singh et al disclose layers of the inorganic material, and therefore disclose a laminate which includes at least two layers; Chiao therefore discloses a laminate having between 100 and 1000 layers.

With regard to Claim 14, Singh et al disclose a nanocomposite, as stated above, and therefore disclose layers of organic material having a thickness of 1 nm.

With regard to Claims 20 – 21, the layers disclosed by Singh et al comprise polydimethylsiloxane (column 4, lines 45 – 47) and therefore comprise layers made from polymer precursors to which a hydrophobic group comprising methyl has been added.

With regard to Claims 23 – 24, the film disclosed by Singh et al is utilized as food packaging (column 1, lines 62 – 65) and Singh et al therefore disclose an article of manufacture, comprising food, having the film disposed on the surface.

With regard to Claim 27, the organic polymer disclosed by Singh et al comprises polystyrene (column 4, lines 45 – 47).

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 16 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al (U.S. Patent No. 6,057,035) in view of Singh et al (WO 00/78540).

Singh et al ('035) disclose a film as discussed above. With regard to Claims 16 – 17, Singh et al fail to disclose a film which has a permeability to oxygen less than 1 cc/m<sup>2</sup>/day and a film which has a permeability to water vapor of less than 1g/m<sup>2</sup>/day. However, Singh et al (WO 00/78540) teach that the permeability of oxygen and water vapor (page 64, lines 16 – 17) is dependent on the amount of silicate (usually small amounts of the silicate are required to achieve good high gas barrier properties; page 64, lines 25 – 29).

Therefore, one of ordinary skill in the art would have recognized the utility of varying the amount of silicate to obtain the desired permeabilities. Therefore, the permeabilities would be readily determined by through routine optimization of the amount of silicate by one having ordinary skill in the art depending on the desired use of the end product as taught by Singh et al.

It therefore would be obvious for one of ordinary skill in the art to vary the amount of silicate in Singh et al in ('035) in order to obtain the desired permeabilities, since the permeabilities would be readily determined through routine optimization by one

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having ordinary skill in the art depending on the desired end result as shown by Singh et al (WO 00/78540).

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiao Singh et al (U.S. Patent No. 6,057,035) in view of Fibiger et al (U.S. Patent No. 6,818,163 B1).

Singh et al discloses a film comprising a nanocomposite laminate comprising silicate as discussed above. Singh et al fails to disclose a laminate which is substantially transparent.

Fibiger et al teach a nanocomposite (films where the layers are 100 nanometers thick; column 6, lines 16 – 19) comprising silicate (column 4, lines 10 – 11) which is substantially transparent (column 6, lines 29 – 34) for the purpose of obtaining a film that allows the passage of ultraviolet light (the film is ultraviolet transparent; column 6, lines 29 – 34). One of ordinary skill in the art would therefore have recognized the advantage of providing for the transparency of Fibiger in Singh et al, which is a nanocomposite, depending on the desired passage of light of the end product.

It therefore would be obvious for one of ordinary skill in the art to provide for transparency in Singh et al in order to obtaining a film that allows the passage of ultraviolet light as taught by Fibiger et al.

8. Claims 18 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al (U.S. Patent No. 6,057,035) in view of Ogawa et al (U. S. Patent No. 5,372,888).

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Singh et al disclose a film comprising barrier properties, as discussed above. With regard to Claims 18 – 19, Singh et al fail to disclose a superhydrophobic layer comprising fluoroalkylsilane.

Ogawa et al teach the coating of a polymer surface (column 4, lines 23 – 27) with a fluoroalkylsilane layer (alkyl fluoride – containing chlorosilane layer), therefore a superhydrophobic layer, for the purpose of obtaining a layer that is anti – contaminating (column 3, lines 55 – 59). One of ordinary skill in the art would therefore recognize the advantage of providing for the layer of Ogawa et al in Singh et al, which is a polymer and therefore comprises a polymer surface, depending on the desired anti – contamination properties of the end product.

It therefore would have been obvious for one of ordinary skill in the art to have provided for a superhydrophobic layer comprising fluoroalkylsilane in Singh et al in order to obtain a layer that is anti – contaminating as taught by Ogawa et al.

9. Claims 22, 26 and 31 – 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al (U.S. Patent No. 6,057,035) in view of Brinker et al (U.S. Patent No. 6,264,741 B1).

Singh et al discloses barrier film that is a multilayer nanocomposite as discussed above. The film comprises a surfactant (page 33, lines 19 – 20). With regard to Claims 22, 26 and 31 – 33, Singh et al fail to disclose a surfactant comprising a Gemini surfactant and layers in the form of tubules and self assembled layers of inorganic material and organic polymer and a coating layer which is self assembled.

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Brinker et al teach the use of a Gemini surfactant (column 4, lines 45 – 46) and tubules (column 8, line 6) and layers which are self assembled and are coatings (column 5, lines 7 – 31) in a nanocomposite (column 3, lines 56 – 57) for the purpose of obtaining a nanocomposite having high capacitance (column 3, lines 51 – 55). One of ordinary skill in the art would therefore recognize the advantage of providing for the Gemini surfactant and tubules and layers which are self assembled and are coatings of Brinker et al in Singh et al, which is a nanocomposite, depending on the desired capacitance of the end product.

It therefore would have been obvious for one of ordinary skill in the art to provide for a Gemini surfactant and tubules and self assembled layers of inorganic material and organic polymer and a coating layer which is self assembled in Singh et al in order to obtain a surface having high capacitance as taught by Brinker et al.

#### ANSWERS TO APPLICANT'S ARGUMENTS

10. Applicant's arguments regarding the 35 U.S.C. 102(b) rejection of Claims 12 – 14, 20 – 21, 23 – 25 and 27 – 29 as being anticipated by Chiao (U.S. Patent No. 6,472,467 B1), of record in the previous Action, have been considered and have been found to be persuasive. The rejection is therefore withdrawn. The new rejections above are directed to amended Claims 12 – 35.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc A Patterson whose telephone number is 571-272-1497. The examiner can normally be reached on Mon - Fri 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Marc Patterson 5/1/06*

Marc A. Patterson, PhD.  
Examiner  
Art Unit 1772